

REMARKS

Favorable reconsideration of this application, in view of the present amendment and in light of the following discussion, is respectfully requested.

Claims 1-12 are pending. In the present amendment, Claims 1-3 and 5-7 are currently amended and new Claims 8-12 are added. Support for the present amendment can be found in the original specification, for example, at page 16, line 17 to page 17, line 9, at page 17, line 23 to page 18, line 23, at page 31, lines 15-27, in Claim 7, and in Figure 1. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claim 7 was objected to; Claims 1, 2, 5, and 6 were rejected under 35 U.S.C. § 112, second paragraph, Claims 1 and 3-5 were rejected under 35 U.S.C. § 102(b) as anticipated by Lefevre et al. (U.S. Patent No. 5,334,004, hereinafter “Lefevre”); Claim 2 was rejected under 35 U.S.C. § 103(a) as unpatentable over Lefevre in view of Steinetz et al. (U.S. Patent No. 5,076,590, hereinafter “Steinetz”); Claims 6/1 and 6/3-6/5 were rejected under 35 U.S.C. § 103(a) as unpatentable over Lefevre in view of Maeda et al. (U.S. Patent No. 4,815,418, hereinafter “Maeda”); and Claim 6/2 was rejected under 35 U.S.C. § 103 as unpatentable over Lefevre in view of Steinetz and Maeda.

Initially, Applicant would like to thank Examiner Stimpert and Supervisory Patent Examiner Kramer for the courtesy of an interview granted to Applicant’s representative on April 7, 2008, at which time the outstanding issues in this case were discussed. Arguments and amendments based on the discussion during the interview are presented hereinafter.

In response to the outstanding objection to Claim 7, it is noted that Claim 7 as amended is no longer in multiple dependent claim form. Thus, it is respectfully requested that the objection to Claim 7 be withdrawn.

In response to the rejection under 35 U.S.C. § 112, second paragraph, Claims 1, 2, 5, and 6 are amended to correct the noted informalities. It is respectfully submitted that no new

matter is added. In view of the amendments made to Claims 1, 2, 5, and 6, it is believed that all pending claims are definite and no further rejection on that basis is anticipated. However, if the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work with the Examiner in a joint effort to derive mutually acceptable language.

Turning now to the rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a), Applicant respectfully requests reconsideration of these rejections and traverses these rejections, as discussed below.

Amended Claim 1 recites:

A hot-gas blowing fan, comprising:
a heat resisting impeller cantilevered by a rotating shaft;
a bearing attached to the rotating shaft;
a heat insulating layer disposed between the impeller and the bearing;
a cooling portion disposed between the heat insulating layer and the bearing, and the cooling portion includes a cooling fluid to remove heat from the bearing and the rotating shaft without contacting the bearing or the rotating shaft;
a first magnetic coupling disposed on a shaft end of the rotating shaft at a side opposite to the impeller;
a second magnetic coupling configured to be mated with the first magnetic coupling and disposed on a shaft end of a driving shaft of a motor; and
a non-magnetic partition wall disposed between the first magnetic coupling and the second magnetic coupling,
wherein a space surrounding the rotating shaft is hermetically sealed from an exterior of the hot-gas blowing fan by the non-magnetic partition wall and a casing.

The hot-gas blowing fan recited in amended Claim 1 includes a cooling portion disposed between the heat insulating layer and the bearing such that the heat insulating layer is not in contact with the bearing. Accordingly, the bearing is protected from damage due to

high temperatures. Additionally, the cooling portion includes a cooling fluid within the cooling portion that does not contact the bearing or the rotating shaft. Thus, the performance of the bearing is not adversely affected by contact with the cooling fluid and the cooling fluid does not leak into the area including the heat resisting impeller. It is respectfully submitted that the cited references do not disclose or suggest every feature recited in amended Claim 1.

Lefevre describes a compressor for processing a flow of dangerous gas, including a rotor 14 mounted on an end of a rotary shaft 20, and that the shaft is supported by bearings 24.¹ Additionally, Lefevre describes an end of the shaft 20 supported by the bearings 24 is enclosed by a bell 26 to delimit a sealed enclosure 30.² Further, the sealed enclosure 30 described in Lefevre is filled with a liquid under pressure, said liquid designed to lubricate the bearings 24.³

However, it is respectfully submitted that Lefevre does not disclose or suggest “a cooling portion disposed between the heat insulating layer and the bearing, and the cooling portion includes a cooling fluid to remove heat from the bearing and the rotating shaft without contacting the bearing or the rotating shaft,” as recited in amended Claim 1.

Instead, as can be seen in Figure 1 of Lefevre, the cooling fluid flowing through the sealed enclosure 30 would directly contact the bearings 24 and the shaft 20. Further, as discussed above, Lefevre describes that the fluid is intended to contact the bearings 24 to lubricate them.

Therefore, it is respectfully submitted that Lefevre does not disclose or suggest every feature recited in amended Claim 1. Thus, it is respectfully requested that the rejection of Claim 1, and all claims dependent thereon, as anticipated by Lefevre be withdrawn.

¹ See Lefevre, at column 3, lines 11-13 and 24-27 and in Figure 1.

² See Lefevre, at column 3, lines 28-37 and in Figure 1.

³ See Lefevre, at column 3, lines 53-59.

Amended Claim 3 recites, *inter alia*, a hot-gas cooling fan, including “a heat receiving portion disposed between the heat insulating layer and the bearing, and the heat receiving portion includes a cooling fluid to remove heat from the bearing and the rotating shaft without contacting the bearing or the rotating shaft.”

Accordingly, for at least the reasons discussed above with respect to Claim 1, it is respectfully submitted that Lefevre does not disclose or suggest every feature recited in amended Claim 1. Thus, it is respectfully requested that the rejection of Claim 3, and all claims dependent thereon, as anticipated by Lefevre be withdrawn.

Turning now to the remaining rejections in the Office Action, Applicant respectfully submits that neither of the remaining secondary references (Steinetz and Maeda) cures the deficiencies noted above with respect to Lefevre. Therefore, for at least the reasons discussed above, it is respectfully submitted that Claims 2 and 6 patentably define over all the cited references. Thus, it is respectfully requested that the outstanding rejections of Claims 2 and 6 be withdrawn.

New Claims 8-12 are added by the present amendment. Support for new Claims 8-12 can be found in the original specification, for example, at page 16, line 17 to page 17, line 9, at page 17, line 23 to page 18, line 23, at page 31, lines 15-27, in Claim 7, and in Figure 1. Thus, it is respectfully submitted that no new matter is added.

It is noted that new Claims 8-12 each depend on one of independent Claims 1 or 3. Thus, it is respectfully submitted that new Claims 8-12 patentably define over the cited references for at least the reasons discussed above with respect to Claims 1 and 3.

Further, new Claim 9 recites, *inter alia* “a heat insulating spacer disposed between the heat insulating layer and the cooling portion to block heat transfer between the heat insulating layer and the cooling portion.”

As can be seen in Figure 1 of Lefevre, Lefevre does not disclose or suggest a spacer configured to block heat transfer between the right side of the rotor housing and the cooling fluid running through the sealed enclosure 30. Thus, it is respectfully submitted that new Claim 9, and new Claim 10 which recites similar features, patentably define over Lefevre.

New Claim 11 recites, *inter alia*, “a temperature of the cooling fluid is higher than a temperature of a dew-point of a process gas blown by the hot-gas blowing fan.”

As discussed above, Lefevre describes that the sealed enclosure 30 is designed to be filled with a liquid under pressure. Thus, Lefevre does not disclose or suggest that a temperature of the cooling fluid is higher than a temperature of the dew-point of a process gas since sealed enclosure 30 is filled with the fluid. Consequently, it is respectfully submitted that new Claim 11 patentably defines over Lefevre.

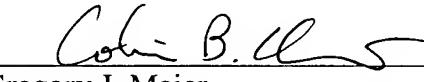
New Claim 12 recites, *inter alia*, “a pressure in the heat receiving portion is adjusted so that a boiling point of the cooling fluid is higher than a dew-point of a process gas blown by the hot-gas blowing fan.”

Accordingly, it is possible to avoid dew condensation by setting the boiling point of the cooling fluid higher than the dew-point of a process gas. In view of the above discussion of Lefevre, it is respectfully submitted that Lefevre does not disclose or suggest adjusting a pressure so that a boiling of the cooling fluid is higher than a temperature of the dew-point of a process gas. Consequently, it is respectfully submitted that new Claim 12 patentably defines over Lefevre.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. A Notice of Allowance is earnestly solicited.

Respectfully submitted,

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